

AMENDMENT UNDER 37 C.F.R. § 1.114(c)
U.S. APPLICATION NO. 09/614,592
ATTORNEY DOCKET NO. Q60082

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (*Currently Amended*) A path search circuit in a CDMA cellular system, comprising:
 - an antenna having a plurality of elements;
 - a plurality of radio receivers for frequency-converting radio frequency signals received respectively by the elements of the antenna into respective baseband signals;
 - a plurality of A/D converters for converting the respective baseband signals into digital data;
 - a plurality of correlation processors for calculating cross correlations between the digital data converted from the baseband signals and a signal known at a reception side, and outputting respective correlation signals;
 - a weighted-mean-value processor for weighting and adding the correlation signals output from said correlation processors based on indicated weighting coefficients, storing the weighted and added correlation signals as interim calculated results, and averaging a plurality of interim calculated results stored over the weighted and added correlation signals for a predetermined amount of time~~number of times~~;
 - a correlation peak detector for detecting at least one peak from the ~~weighted, added and averaged interim calculated results~~ correlation signals output as delay profiles from said weighted-mean-value processor, and outputting a reception level and reception timing

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corresponding to the detected peak as a reception level and reception timing of a reception path;
and

a weighting controller for controlling said weighting coefficients to determine a directivity of said antenna and generating a plurality of weighting coefficients to establish a plurality of general antenna directivities for dividing a sector where a mobile terminal with which to communicate is present, when a communication session starts.

2. (*Currently Amended*) A path search circuit according to claim 1, wherein said weighted-mean-value processor comprises:

a first memory for temporarily storing the correlation signals output from said correlation processors;

as many second memories as the number of antenna directivities to be established, for storing the interim calculated results of the weighted and added correlation signals for the respective antenna directivities; and

processing means for multiplying the correlation signals read from said first memory by the weighting coefficients indicated by said weighting controller, adding the multiplied correlation signals into a sum signal, determining the power of the sum signal, updating the interim calculated results stored in said second memories based on the determined power, averaging the updated interim calculated results for a predetermined number of times to obtain weighted means of correlation values, and outputting the obtained weighted means as delay profiles.

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3. (*Original*) A path search circuit according to claim 2, wherein said weighted-mean-value processor further comprises an interpolation filter for sampling again the weighted correlation signals at a frequency higher than a sampling frequency of said A/D converters to increase a sampling rate.

4. (*Original*) A path search circuit according to claim 1, wherein said weighting controller comprises means for generating combinations of weighting coefficients for establishing an antenna directivity in a plurality of directions in which a party to communicate with is possibly present, when the communication session starts, and reducing the number of combinations to be generated during the communication session so as to be smaller than the number of combinations to be generated when the communication session starts.

5. (*Original*) A path search circuit according to claim 2, wherein said weighting controller comprises means for establishing an antenna directivity in a plurality of directions in which a party to communicate with is possibly present, when the communication session starts, and reducing the number of combinations to be generated during the communication session so as to be smaller than the generating combinations of weighting coefficients for number of combinations to be generated when the communication session starts.

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6. (*Original*) A path search circuit according to claim 3, wherein said weighting controller comprises means for generating combinations of weighting coefficients for establishing an antenna directivity in a plurality of directions in which a party to communicate with is possibly present, when the communication session starts, and reducing the number of combinations to be generated during the communication session so as to be smaller than the number of combinations to be generated when the communication session starts.

7. (*Previously Presented*) A path search circuit according to claim 1, wherein said weighted-mean-value processor further comprises means for averaging the power of said weighted and added correlation signals according to a moving average method.

8. (*Previously Presented*) A path search circuit according to claim 2, wherein said weighted-mean-value processor further comprises means for averaging the power of said sum signal according to a moving average method.

9. (*Previously Presented*) A path search circuit according to claim 1, wherein said weighted-mean-value processor further comprises means for averaging the power of said weighted and added correlation signals according to a method of generating an exponentially weighted mean in time with forgetting coefficients.

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10. (*Previously Presented*) A path search circuit according to claim 2, wherein said weighted-mean-value processor further comprises means for averaging the power of said sum signal according to a method of generating an exponentially weighted mean in time with forgetting coefficients.

11. (*New*) A path search circuit in a CDMA cellular system, comprising:

- an antenna having a plurality of elements;
- a plurality of radio receivers for frequency-converting radio frequency signals received respectively by the elements of the antenna into respective baseband signals;
- a plurality of A/D converters for converting the respective baseband signals into digital data;
- a plurality of correlation processors for calculating cross correlations between the digital data converted from the baseband signals and a signal known at a reception side, and outputting respective correlation signals;
- a weighted-mean-value processor for weighting and adding the correlation signals output from said correlation processors based on indicated weighting coefficients, and averaging the weighted and added correlation signals for a predetermined number of times, wherein said weighting controller comprises means for generating combinations of weighting coefficients for establishing an antenna directivity in a plurality of directions in which a party to communicate with is possibly present, when the communication session starts, and reducing the number of

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combinations to be generated during the communication session so as to be smaller than the number of combinations to be generated when the communication session starts;

a correlation peak detector for detecting at least one peak from the weighted, added and averaged correlation signals output as delay profiles from said weighted-mean-value processor, and outputting a reception level and reception timing corresponding to the detected peak as a reception level and reception timing of a reception path; and

a weighting controller for controlling said weighting coefficients to determine a directivity of said antenna and generating a plurality of weighting coefficients to establish a plurality of general antenna directivities for dividing a sector where a mobile terminal with which to communicate is present, when a communication session starts.

12. (*New*) A path search circuit according to claim 11, wherein said weighted-mean-value processor comprises:

a first memory for temporarily storing the correlation signals output from said correlation processors;

as many second memories as the number of antenna directivities to be established, for storing interim calculated results of the weighted and added correlation signals for the respective antenna directivities; and

processing means for multiplying the correlation signals read from said first memory by the weighting coefficients indicated by said weighting controller, adding the multiplied correlation signals into a sum signal, determining the power of the sum signal, updating the

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interim calculated results stored in said second memories based on the determined power, averaging the updated interim calculated results for a predetermined number of times to obtain weighted means of correlation values, and outputting the obtained weighted means as delay profiles.

13. (*New*) A path search circuit according to claim 12, wherein said weighted-mean-value processor further comprises an interpolation filter for sampling again the weighted correlation signals at a frequency higher than a sampling frequency of said A/D converters to increase a sampling rate.

14. (*New*) A path search circuit according to claim 12, wherein said weighting controller comprises means for establishing an antenna directivity in a plurality of directions in which a party to communicate with is possibly present, when the communication session starts, and reducing the number of combinations to be generated during the communication session so as to be smaller than the generating combinations of weighting coefficients for number of combinations to be generated when the communication session starts.

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15. (*New*) A path search circuit according to claim 11, wherein said weighted-mean-value processor further comprises means for averaging the power of said weighted and added correlation signals according to a moving average method.

16. (*New*) A path search circuit according to claim 12, wherein said weighted-mean-value processor further comprises means for averaging the power of said sum signal according to a moving average method.

17. (*New*) A path search circuit according to claim 11, wherein said weighted-mean-value processor further comprises means for averaging the power of said weighted and added correlation signals according to a method of generating an exponentially weighted mean in time with forgetting coefficients.

18. (*New*) A path search circuit according to claim 12, wherein said weighted-mean-value processor further comprises means for averaging the power of said sum signal according to a method of generating an exponentially weighted mean in time with forgetting coefficients.